

**Evaluation of Recycled Material Content as  
an Environmental Attribute for  
Inclusion in the FLIS  
Database System**

June 24, 1999

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## TABLE OF CONTENTS

<b>CHAPTER 1:INTRODUCTION .....</b>	<b>4</b>
<b>CHAPTER 2: EVALUATION APPROACH .....</b>	<b>6</b>
EVALUATION CRITERIA .....	6
<i>Policy priority?</i> .....	6
<i>Definable?</i> .....	7
<i>Show a cost benefit?</i> .....	7
APPROACH.....	8
<b>CHAPTER 3: RECYCLED MATERIAL CONTENT.....</b>	<b>9</b>
IS IT A POLICY PRIORITY?.....	10
<i>Pollution Prevention Act</i> .....	10
<i>Executive Order 12856</i> .....	11
<i>Executive Order 12873</i> .....	11
<i>Executive Order 13101</i> .....	11
<i>States Recycled Content Regulations</i> .....	11
ATTRIBUTE DEFINITION .....	11
<i>Aluminum</i> .....	12
<i>Steel</i> .....	13
<i>Glass</i> .....	14
LIFE-CYCLE COST ASSESSMENT .....	16
<b>APPENDIX A -PRODUCTS CURRENTLY DESIGNATED IN EPA’S COMPREHENSIVE PURCHASING GUIDELINES .....</b>	<b>19</b>
<b>APPENDIX B - ACRONYMS.....</b>	<b>20</b>
<b>APPENDIX C - REFERENCES .....</b>	<b>21</b>

## Chapter 1: Introduction

The federal government must comply with laws, Executive Orders, and various policies designed to reduce waste and minimize the environmental impacts of its activities. Federal agencies can minimize the use of hazardous or toxic substances, promote the use of recycled materials, improve energy efficiency, reduce the volume of waste for disposal, conserve natural resources, improve worker health and safety, reduce operating costs, and save taxpayer dollars via the procurement of environmentally oriented products.

The Federal Logistics Information System (FLIS) is the centerpiece of the federal acquisition process. The FLIS is a large database that catalogues almost 7 million records of products and services available in the federal supply system. All federal agencies use FLIS to requisition items through the General Services Administration (GSA) and Defense Logistics Agency (DLA). In February of 1997, the Joint Logistics Commanders (JLC) tasked the DLA to research the feasibility of adding environmental attributes to the FLIS in order to aid procurement personnel and end-users in identifying products with positive environmental attributes. The JLC asked DLA to identify environmental data currently available and possible constraints for adding environmental attributes to FLIS codes; develop cost estimates for expanding FLIS; and make recommendations on how procurement personnel can identify products that have a lesser impact on human health and the environment. DLA accepted this task and conducted a business case analysis that analyzed the potential costs and benefits of using the FLIS to increase the federal acquisition of environmentally oriented products. Exhibit 1 highlights the benefits of an expanded use of environmentally preferable products that were identified in the business case analysis.

**Exhibit 1**  
**Benefits of an Expanded Use of**  
**Environmentally Preferable Products**

- Reduced operating and disposal costs for facilities
- Reduced exposure to hazardous materials, safety hazards, and environmental violations
- Compliance with regulations and executive orders directing increased federal purchasing of environmentally preferable products
- Achievement of DoD affirmative procurement goals

As a result of the business case analysis, DLA established the Environmental Attribute Initiative and formed the Joint Group on Environmental Attributes (JG-EnvAtt) Coordinating Committee to manage the environmental attribute initiative. The committee is headed by the DLA, with other primary stakeholders being the Army, Navy, Air Force, Marine Corps, and the General Services Administration (GSA). Advisors include the Environmental Protection Agency (EPA), Department of Energy (DOE), and other government agencies. The JG-EnvAtt is responsible for selecting priority attributes for evaluation, approving proposed attributes for inclusion in FLIS, and adding the approved attribute to FLIS. The committee has developed three selection criteria for evaluating the proposed attributes for inclusion in the FLIS:

- A regulatory or policy priority must exist;
- A comprehensive definition must be available; and
- A cost benefit must be evident.

The JG-EnvAtt committee identified and prioritized 35 potential environmental attribute categories. Two of these attributes, “energy efficient” and “EPA Comprehensive Procurement Guidelines” have previously been analyzed and an evaluation of their applicability for inclusion in FLIS has been presented to the committee. In November of 1998, JG-EnvAtt tasked Litton-PRC and Project Performance Corporation to evaluate five additional categories:

- Non-ozone depleting substances
- Water conserving
- Low-VOC content
- Non-greenhouse impact
- Recycled material content

Draft evaluations of the “Non-ozone depleting substances”, “Water Conserving”, and “Low-VOC content” environmental attributes have been submitted to DLA. Additionally, the FLIS has been modified and prepared to receive environmental attribute data as of September 1998.

The purpose of this report is to evaluate *recycled material content* as an environmental attribute for inclusion in FLIS. This report highlights the underlying policy priorities, provides standard definitions, and presents associated life-cycle costs associated with this environmental attribute. However, the focus of this report is limited to evaluating the environmental attribute *recycled material content* as it applies to aluminum, steel, and glass products. The reason for this narrow focus is that these materials were not included in EPA’s Comprehensive Procurement Guidelines (CPG), which have already been analyzed for inclusion in FLIS. The CPG designates products containing recovered materials for government agencies to purchase and are organized into product categories, which include: paper and paper products, vehicular products, construction products, transportation products, park and recreation products, landscaping products, non-paper office products, and miscellaneous products. The complete list of products currently designated in the CPG is included in Appendix A.

Litton-PRC and Project Performance Corporation prepared this report, with the assistance and guidance of the JG-EnvAtt Coordinating Committee.

## Chapter 2: Evaluation Approach

Federal procurement agencies have initiated activities to encourage the procurement of environmentally preferable products. Various catalogs and guides have been developed for the procurement of environmentally preferable alternatives to conventional products; however, existing catalogs are not linked to the FLIS, which characterizes over 7 million items by over 240 codes, including national stock number, manufacturer, procuring agency, and price. These elements, which define the product's "form, fit, and function," assist the procurement personnel and end-users in choosing items that are appropriate for their need.

The DLA defines environmentally preferable as products or services that have a *"lesser or reduced effect on human health and the environment when compared with competing products or services that serve the same purpose."* The comparison of environmentally preferable products with other products may consider raw materials acquisition, production, manufacturing, packaging, distribution, reuse, operation, maintenance, and/or disposal of the product or service.

Incorporating positive environmental attributes in the FLIS will increase the visibility and procurement of environmentally preferable products. The use of environmentally preferable products will minimize the use of hazardous/toxic substances, improve energy efficiency, promote the use of recycled materials, and conserve natural resources.

### Evaluation Criteria

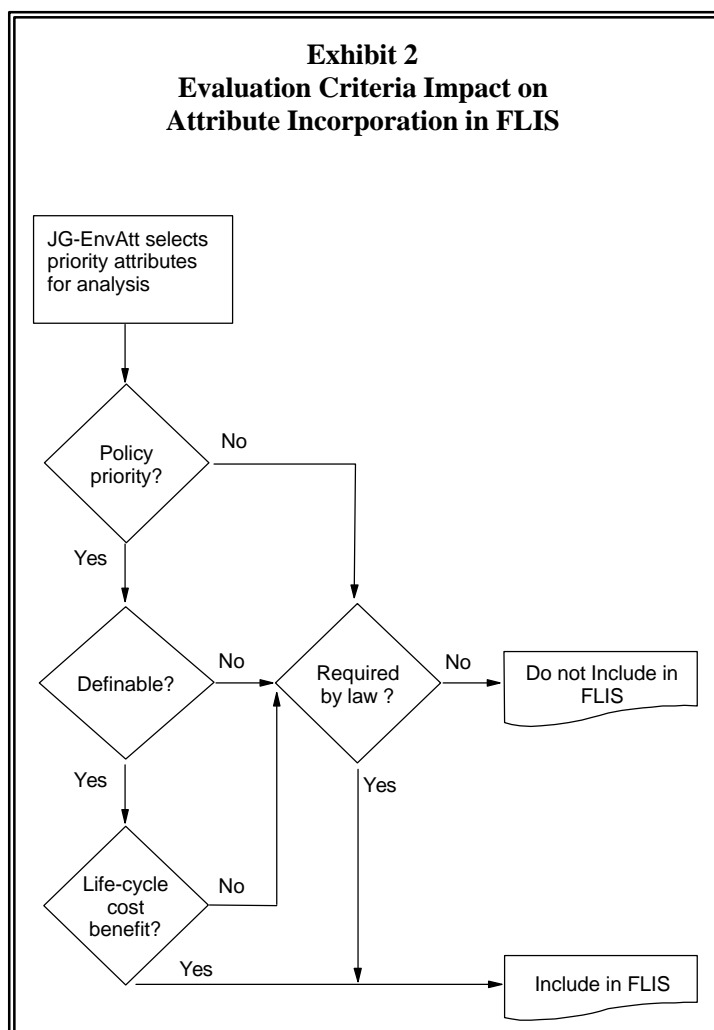
The process of selecting and including potential environmental attributes in FLIS involves evaluating each attribute against three selection criteria:

- Be a policy priority;
- Clearly definable; and
- Show a life-cycle cost benefit.

Exhibit 2 illustrates how these criteria impact whether an attribute is incorporated into the FLIS system.

#### Policy priority?

A potential environmental attribute must have a federal policy priority. On the largest scale, compliance is required under federal environmental laws,



regulations, and executive orders. Additionally, federal procurement personnel must comply with Federal Acquisition Regulations, which provide further direction concerning implementation requirements contained in regulations and Executive Orders. Finally, departmental policies or initiatives may exist that govern affirmative procurement of environmentally oriented products. Environmental stewardship programs and green design projects may also affect procurement decisions. All of these environmental laws, regulations, policies, and initiatives indicate that a particular environmental initiative is a priority both from the policy standpoint and a public consciousness standpoint.

#### Definable?

If an environmental attribute proves to be a policy priority, it must be clearly defined. The intent of adding environmental attributes to the FLIS is to contribute to the procurement personnel's understanding of the product and why it is preferable to a similar product without the environmental attribute. Procurement personnel must be able to identify products with these attributes from similar products available in the database. The environmental attribute field must contribute information that is understandable, and capable of distinguishing between products of similar form, fit, and function. Therefore, the attribute definitions must be unambiguous and include some quantifiable characteristic.

#### Show a cost benefit?

Provided the environmental attribute is both a policy priority and definable, it now must be shown to provide a cost benefit when compared to similar products without the environmental attribute. Information concerning cost-effectiveness of an environmental attribute may be found in regulatory impact analyses and in governmental and non-governmental cost studies.

Additionally, a life-cycle cost assessment may be beneficial and/or required as a means of acquisition planning. The cost assessment tracks the costs associated with a particular product from procurement through use, handling and disposal.<sup>1</sup> Often, a higher initial purchase price for environmentally oriented products is off-set by reduced costs associated with:

- Material storage and handling;
- Use of energy, water, and other resources;
- Waste storage, treatment, and disposal;
- Compliance, permitting, and reporting; and
- Liability for work-related injuries and environmental contamination.

In other cases, the results of the cost assessment may be overridden by the requirements of a federal directive or agency policy.

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<sup>1</sup> This analysis does not evaluate the cost associated with manufacturing environmentally preferable products relative to other products. Any costs incurred prior to procurement are excluded from this evaluation.

## Approach

This report documents the multi-step process used to evaluate *recycled material content* as an environmental attribute. First Litton-PRC and PPC researched government, industrial, and international regulations, policies, and definitions to determine if a policy priority exists for the proposed attribute. Some of the primary sources used for this analysis are listed in Exhibit 3.

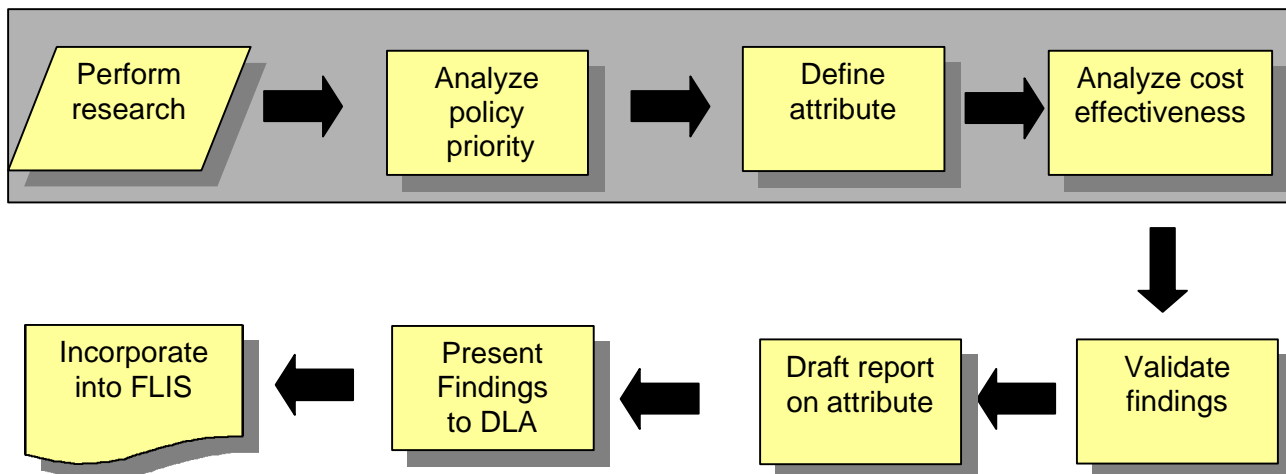
A definition of the attribute was developed based upon this research and validated by subject matter experts at EPA and other federal agencies. For some potential attributes, the existing definitions are vague, originate from numerous sources, and are inconsistent. In order to ensure that any interpretation of the existing definitions remained consistent with the common, accepted definition, the project team asked experts in the subject to validate the definitions established.

Upon validation of the established definition, additional research was conducted on the attribute's life-cycle cost impacts. The overall process used to research the selected environmental attribute is presented in Exhibit 4.

### Exhibit 3 Primary Research Sources

- Laws and regulations
- Executive Orders
- DoD affirmative procurement goals
- EPA Partners for the Environment Programs
- Interest group studies
- International standards
- Regulatory impact analyses
- Governmental and NGO cost studies
- DLA inventory control points
- FTC guides for the use of environmental marketing claims (16 CFR Part 260)
- Scientific certification systems - lists of certified products and claims
- ISO 14020 - Guiding Principles for Environmental Labeling Programs (Draft)

### Exhibit 4 Research Approach



## Chapter 3: Recycled Material Content

The myriad benefits associated with recycling materials, especially recycling of steel, aluminum, and glass, are well documented. In addition to conserving natural resources, recycling materials reduces the energy required and the emissions released during manufacturing processes; it also reduces the volume of wastes sent to landfills and incinerators. Recycling materials results in a decreased demand for raw materials, which consequently lessens the environmental impacts associated with extraction and harvesting of these materials. Further, recycling of materials generally has a number of economic benefits. The process of turning used materials into new products can result in business expansion and additional jobs. However, these benefits associated with recycling are not achieved unless a market exists for products containing recycled materials. In other words, purchasing products with recycled material content is an essential component of ensuring that the recycling process is complete and promotes the continued manufacture of these products.

The U.S. Environmental Protection Agency (EPA) defines recycled content “the portion of a product, by weight or volume, that is composed of pre-consumer and/or post-consumer recovered materials.”<sup>2</sup>

- **Pre-consumer materials** are those “materials recovered for recycling prior to use by the consumer, excluding materials and by-products generated from and commonly reused within an original manufacturing process.”<sup>3</sup> Examples of pre-consumer recovered materials, which are included in the definition of *recycled material content*, are the scrap trimmings and glass broken during the manufacturing process.

In the glass, steel, and aluminum industries, a portion of “virgin” materials (i.e., materials that have not yet been used in product form) are routinely reprocessed. This reprocessing occurs at the plant as part of the manufacturing process. Materials that have always been reincorporated into the production process, and consequently would have never been sent for disposal, are excluded from the definition of *recycled material content*.

- **Post-consumer materials** are defined as “a material or finished product that has served its intended use and has been diverted or recovered from waste destined for disposal, having completed its life as a consumer item.”<sup>4</sup> An example of a post consumer recovered material is a used beverage container.

The recycled component of a product can originate from a number of sources, including industry, commercial and institutional establishments, and households.

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<sup>2</sup> U.S. Environmental Protection Agency, *WasteWise Tip Sheet: Buying or Manufacturing Recycled Products*, EPA530-F-94-005, January 1994, page 2.

<sup>3</sup> Ibid

<sup>4</sup> 40 CFR 247.3, page 45561.

### Is it a Policy Priority?

Research indicates that purchasing products that contain *recycled material content* is a policy priority due to the existence of national and state policies:

- The Pollution Prevention Act (PPA)– Establishes pollution prevention as the public policy of the United States. The Act states that pollution should be prevented or reduced at the source wherever feasible; when pollution is not preventable, it should be recycled or treated in an environmentally safe manner.
- Executive Order 12856 – Requires Federal agencies to comply with the PPA of 1990 by developing management and acquisition programs that promote pollution prevention.
- Executive Order 12873 – Requires the Federal Government to make more efficient use of natural resources by maximizing recycling, preventing waste, and using and procuring environmentally preferable products and services.
- Executive Order 13101 – Requires the Federal Government to work to increase its preference and demand for products that contain recycled content materials.
- States recycled content requirements – Several states require the recycling of beverage containers.

Each of these initiatives and their impact on or support of *recycled material content* as an environmental attribute is discussed in further detail in the following sections.

#### Pollution Prevention Act

The policy of the PPA is stated as follows:

The congress hereby declares it to be the national policy of the United States that pollution should be prevented or reduced at the source whenever feasible; pollution that cannot be prevented should be recycled in an environmentally safe manner, whenever feasible; pollution that cannot be prevented or recycled should be treated in an environmentally safe manner whenever feasible; and disposal or other release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner.

This focus of the PPA is to reduce the amount of pollution through cost-effective changes in production, operation, and raw materials use. Pollution prevention (P2) also includes other practices that increase efficiency in the use of energy, water, or other natural resources, and protect the resource base through conservation. These goals are achieved through practices such as recycling, source reduction, and sustainable agriculture. Purchasing products that contain recycled material supports the P2 goals.

### Executive Order 12856

Executive Order 12856 was signed August 4, 1993 and tasks federal agencies with complying with the PPA of 1990. Federal agencies focus facility management and acquisition activities so as to reduce overall pollution levels.

### Executive Order 12873

Executive Order 12873, which details federal acquisition, recycling, and waste prevention, was signed on October 20, 1993. This order specifically requires federal agencies to incorporate waste prevention and recycling into the daily operations, and places emphasis on the acquisition of “environmentally preferable” products and services. Environmentally Preferable is defined as “products or services that have a lesser or reduced effect on human health and the environment when compared with competing products or services that serve the same purpose.”<sup>5</sup>

### Executive Order 13101

Executive Order 13101 is titled *Greening the Government through Waste Prevention, Recycling, and Federal Acquisition*, and was signed on September 16, 1998. This executive order specifically requires the Federal Government to work to increase its preference and demand for products that contain recycled content materials. The order calls for a “Government-wide Waste Prevention and Recycling Strategic Plan” that should include “direction and initiatives for acquisition of recycled and recyclable products and environmentally preferable products and services.”<sup>6</sup>

### States Recycled Content Regulations

Recycling of beverage containers is now required by law in many US states. California’s Assembly Bill Number 2622 requires percentages of cullet, the term applied to broken or scrap glass, in glass containers. California’s recycled content requirements are discussed further in the following section.

### Attribute Definition

Previous to this report, DLA evaluated materials included in EPA’s Comprehensive Procurement Guidelines (CPG) for inclusion in FLIS. The CPG designates products containing recovered materials for government agencies to purchase and are organized into product categories, which include: paper and paper products, vehicular products, construction products, transportation products, park and recreation products, landscaping products, non-paper office products, and miscellaneous products. The complete list of products currently designated in the CPG is included in Appendix A. The focus of this report is limited to evaluating the environmental attribute *recycled material content* as it applies to aluminum, steel, and glass products because these materials were not included in EPA’s CPG.

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<sup>5</sup> Executive Order 12873, “Federal Acquisition, Recycling, and Waste Prevention,” October 20, 1993, page 2.

<sup>6</sup> Executive Order 13101, “Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition,” September 16, 1998, page 49645.

There is no unambiguous definition for *recycled material content* as it applies to aluminum or steel. There is, however, an unambiguous definition for *recycled material content* as it applies to glass. This definition, as well as the reasons why unambiguous definitions cannot be developed for aluminum and steel, is discussed below, organized by material type.

### Aluminum

Developing an unambiguous definition of *recycled aluminum content* requires a level, or percentage of recycled material content that would constitute an “environmentally preferable product.” However, there is no readily discernable way within the scope of this analysis to determine the amount of recycled materials in any single aluminum product. A standard part of the aluminum production process is to use as much old scrap material as possible in manufacturing new aluminum products. Manufacturers purchase scrap material rather than the virgin (or raw) materials whenever possible because scrap material is much less expensive. The primary source of old scrap material is aluminum cans, which make up more than 50 percent of old aluminum scrap material. All of the recovered aluminum cans are melted and mixed with virgin raw materials. Consequently, the percentage of *recycled aluminum content* in any one product will depend on how much old scrap material is available that specific time (e.g., based on market availability).

The industry does not track the amount of recycled material in any single aluminum product. Instead, the Aluminum Association calculates the average amount of recycled content per aluminum can produced at the end of each calendar year. For example, Exhibit 5 contains the Aluminum Association’s calculations for 1997.

#### Exhibit 5. Calculating the Average Percentage of Recycled Aluminum Content per Can in 1997<sup>7</sup>

Used beverage can recovery rate (adjusted for exports and non-can use)	Estimated net weight of cans shipped	Content percentage
1.69 billion pounds	3.09 billion pounds	54.7%

Using this same calculation method, the Aluminum Association estimates that the average percentage of recycled aluminum content per can was 51.4 in 1998.<sup>8</sup>

Because using recycled aluminum content to produce new aluminum products is extremely cost effective, manufactures do not need additional incentives to incorporate recycled material into the manufacturing process. Aluminum is the only packaging material that more than covers its own cost of collection and processing.<sup>9</sup> In addition, aluminum recycling saves 95 percent of the

<sup>7</sup> <http://206.67.86.150/newsa.cfm?pressid=26>

<sup>8</sup> Sattlethight, Hank. Aluminum Association; personal communications; May 10, 1999

<sup>9</sup> <http://www.aluminum.org/default2.cfm/4/33>

energy needed to produce aluminum from ore.<sup>10</sup> Consequently, manufactures of aluminum products use all of the available recycled material in their manufacturing processes.

## Steel

To develop an unambiguous definition of *recycled steel content* also requires a level, or percentage of recycled material content, that constitutes an “environmentally preferable product.” For products made of steel, like those made of aluminum, there is no readily discernable way within the scope of this analysis to determine the amount of recycled materials in any particular product. In fact, all new steel products contain some recycled steel material.<sup>11</sup>

Many different types of steel products are recycled to make new steels products, including cans, automobiles, appliances, structural beams and plates, and reinforcement bar. The amount of recycled material content in steel depends on the type of furnace used to make the new product.

There are two types of furnaces to make new steel:

1. **Basic oxygen furnace.** The basic oxygen furnace is used to produce steel that is used in flat-rolled steel products (e.g., cans, appliances, automobiles). This type of furnace uses a minimum of 25 percent steel scrap to make new steel.<sup>12</sup>
2. **Electric arc furnace.** The electric arc furnace is used to produce products that require strength and must have long shapes (e.g., steel plate, reinforcement bars, structural beams). This type of furnace melts almost 100 percent steel scrap to make new steel.

The pre- and post-consumer content of steel products in the US is statistically determined using a variety of information at the end of a calendar year. In 1997, the Steel Recycling Institute estimated the average total recycled content of steel for new products. This estimate was based on information from the American Iron and Steel Institute (AISI), the Institute of Scrap Recycling Industries (ISRI), the Bureau of Mines, and a study prepared for the AISI by William T. Hogan, S.A., and Frank T. Koelble of Fordham University. For products made in the basic oxygen furnace, the Steel Recycling Institute estimated that the average recycled content per product is 28 percent, with approximately 15.5 percent from post-consumer recycled content. For products made in the electric arc furnace, the Steel Recycling Institute estimated that the average recycled content per product is 98 percent, with approximately 68.9 percent post-consumer recycled content.<sup>13</sup>

The Steel Recycling Institute explains that individual company statistics are not applicable or instructive “because of the open loop recycling capability that the steel industry enjoys, with available scrap typically going to the closest melting furnace. This open loop recycling allows, for example, an old car to be melted down and used to produce a new soup can, and then, as the

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<sup>10</sup> <http://www.aluminum.org/default2.cfm/4/33>

<sup>11</sup> <http://www.recycle-steel.org/buy/main.html>

<sup>12</sup> <http://www.recycle-steel.org/buy/main.html>

<sup>13</sup> <http://www.recycle-steel.org/buy/BuyInherent.html>

new soup can is recycled, it is melted down to produce a new car, appliance or perhaps a structural beam...”<sup>14</sup>

It is erroneous to assume that a product with 100 percent recycled content is an “environmentally preferable” product to one with 25 percent recycled content because the recycled content is directly attributable to the type of furnace used to make the product. The type of furnace used to make a product is based on the required characteristics of the product desired. In other words, the recycled content of any particular product is driven by the type of furnace used to make the product. All products made in a basic oxygen furnace will contain at least 25 percent recycled steel; all products made in an electric arc furnace will contain approximately 100 percent recycled steel. The actual percentage of recycled material used always depends on market availability. However, all similar products that have comparable strength and shape requirements, must be made in the same type of furnace. The only difference in recycled steel content for a particular type of product, therefore, will be based on market availability at one particular location versus another.

Like aluminum, using recycled steel content to produce new steel products is extremely cost effective. Recycling steel scrap is not only essential to the process of making new steel, steel can be recycled over and over without ever losing quality. Every ton of steel recycled conserves 2,500 pounds of iron ore, 1,400 pounds of coal and 120 pounds of limestone.<sup>15</sup> Consequently, manufactures do not need additional incentives to incorporate recycled material into the manufacturing process.

### Glass

Unlike steel and aluminum, outside incentives have been essential to prompt manufactures into using recycled glass to manufacture new glass products. This is because there are a number of difficulties associated with using cullet, the term applied to broken or scrap glass, to make new glass products. For example, cullet often contains ceramic particles that cause defects in new glass products. There is no economical method for separating ceramic contaminants from the cullet. Further, the cost of cullet approximates the cost of using virgin (batch) materials.<sup>16</sup>

To promote the recycling of glass, some states have set minimum recycled content requirements for glass products. The most definitive criteria for *recycled glass content* is based on California regulations. California regulations require minimum percentages of cullet to be used in manufacturing glass containers and fiberglass.

California’s Assembly Bill Number 2622, approved in 1990, requires:

“each glass container manufacturer to use a specified minimum percentage of Californian postfilled glass [cullet] in the manufacturing of glass food, drink, and beverage containers, and to report to the department each month, beginning October 1, 1991, the

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<sup>14</sup> Ibid.

<sup>15</sup> <http://www.steel.org/facts/recycle.htm>

<sup>16</sup> California Integrated Waste Management Board, *Market Status Report: Container and Plate Glass*, <http://www.ciwmb.ca.gov/mrt/mrktrsch/mdplan96/glass.htm>, downloaded March 12, 1999.

amount of total sales of new glass containers and the percentage of California postfilled glass used in the manufacturing of those containers.”<sup>17</sup>

Division 12.1, Chapter 3 of California’s Public Resources Code requires manufacturers have at least 35 percent cullet in the manufacturing of glass food, drink, or beverage containers. This percentage is measured in the aggregate on an annual basis.<sup>18</sup>

Similarly, Division 12.9, Chapter 2 of California’s Public Resources Code requires manufacturers have at least 30 percent cullet in fiberglass manufactured or sold in the state on and after January 1, 1995. This percentage is to be calculated in tons used on an annual basis.<sup>19</sup>

There may be problems associated with using California’s regulations to define *recycled glass content*. For example:

- Many of the items in the FLIS database that would be affected by a definition for *recycled glass content* are food or beverage products, not the glass products themselves (See Exhibit 6). The manufacturers of these products may not know the percentage of glass cullet used to produce its containers.
- Glass producers (outside of those in states requiring minimum content of recycled glass) might not track the amount of cullet used to make their products. Since the percentage of cullet used is calculated on an annual basis, manufacturers that are not currently tracking this percentage might be excluded from selling their products to DLA for a minimum of one year.

Research outside the scope of this project is necessary to determine how difficult it would be to implement *recycled glass content* as an environmental attribute.

If DLA determines that: 1) state regulations are an acceptable basis for the environmental attribute *recycled glass content*, and 2) the issues associated with implementing the *recycled glass content* attribute are surmountable, our recommendation would be to use California legislation to define the attribute. California pollution prevention regulations are not only more stringent than federal and other states’ regulations, but they also have the national reputation of leading the country in environmental protection, often setting precedence for other states to follow. Based on California legislation, a general unambiguous definition of *recycled glass content* for glass containers can be developed:

*Any glass container that contains 35 percent cullet, measured in the aggregate on an annual basis, and fiberglass that contains a minimum of 30 percent cullet, measured in tons used on an annual basis (as required per California’s Public Resources Code).*

<sup>17</sup> Edwards, George H. and Harben, Peter W., *The North American Glass Industry – Fewer but Larger Players*, <http://www.servtech.com/~cdezines/pwhartnameglass.html>, downloaded March 12, 1999.

<sup>18</sup> California Public Resources Code, Division 12.1, Chapter 3, Section 14549

<sup>19</sup> California Public Resources Code, Division 12.9, Chapter 2, Section 19510 and 19511

## FLIS Product List

The above definition of the attribute, *recycled glass content*, will affect several types of products currently available through the FLIS product catalog. Exhibit 6 identifies typical products that may be distributed in glass containers and are currently purchased through FLIS.

**Exhibit 6. Products Purchased Through FLIS that may have Glass Recycled Material Content**

Federal Stock Class (FSC) Number	Description	Inventory Control Point
5640	Wallboard, Building Paper, Thermal Insulation Materials	Fort Worth, TX
7240	Household and Commercial Utility Containers	Fort Worth, TX
8125	Bottles and Jars	Philadelphia, PA
8930	Jams, Jellies and Preserves	Philadelphia, PA
8960	Beverages, Nonalcoholic	Philadelphia, PA
8965	Beverages, Alcoholic	Philadelphia, PA
9340	Glass Fabricated Materials	Philadelphia, PA

The use of the environmental attribute *recycled glass content* in the FLIS might simplify the choices that federal procurement personnel must make during day to day operations.

## Life-Cycle Cost Assessment

The cost savings associated with recycling aluminum and steel are significant and well documented. Exhibit 7 summarizes the energy and disposal cost savings for steel, aluminum and glass based on the tons of recycled material in one year.

**Exhibit 7. Cost Savings from Recycling (Total Savings in Millions of Dollars)<sup>20</sup>**

Material	Energy Savings Per Ton		Disposal Cost per Ton	Tons Recycled	Total Energy Cost Savings (millions of dollars)	Total Disposal Cost Savings (millions of dollars)
	Mil. BTU	Dollars per BTU				
Steel	11.4	\$94	\$37	72 (1996)	\$6,800 (in 1996)	\$2,700 (in 1996)
Aluminum	177.2	\$1,473	\$37	4 (1997)	\$5,500 (in 1997)	\$140 (in 1997)
Glass	2.3	\$18	\$37	3 (1996)	\$60 (in 1996)	\$100 (in 1996)

Since there is not an unambiguous definition for *recycled aluminum or steel content material*, and consequently these environmental attributes cannot be included in the FLIS database, the remainder of this analysis does not focus on the cost benefits associated with recycling these

<sup>20</sup> Environmental Protection Agency's Office of Solid Waste, *Macroeconomic Importance of Recycling and Remanufacturing*, October 28, 1998.

materials. Instead, the focus of this section relates to the definition provided for *recycled glass content*.

Using cullet to make new glass products results in an energy savings because cullet has already been fused; it is the product of a high-temperature chemical reaction. Consequently, cullet will melt at a lower temperature than feldspar or silica sand, the “virgin” materials used to produce glass. For glass containers, each 10 percent incremental increase in the amount of cullet used to manufacture glass products reduces the amount of energy required to melt the material by approximately 2.5 percent.<sup>21</sup>

Using cullet rather than the raw, “virgin” materials results in an additional benefit: because energy from the combustion of fossil fuels is used to manufacture glass products, energy savings translate into pollution prevention. Decreasing the energy requirements of manufacturing glass products reduces the amounts of oxides of nitrogen (NO<sub>x</sub>) generated, a serious air pollutant.

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<sup>21</sup> Institute of Scrap Recycling Industries, *Scrap Recycling: Where Tomorrow Begins*, Washington, D.C., 1996.

## Chapter 4. Summary and Conclusions

The JG-EnvAtt Coordinating Committee's approach for adding environmental attributes to the FLIS is to identify and evaluate potential environmental attributes based on their policy priority, definability, and life cycle cost savings. This approach was used to evaluate the environmental attribute *recycled material content* as it applies to products made of aluminum, steel, and glass.

This environmental attribute is strongly supported by federal policies, including the Pollution Prevention Act, Executive Orders 12856, 12873, 13101, and various state requirements for purchasing products with recycled content. However, there is no unambiguous definition for *recycled material content* as it applies to aluminum or steel. There is an unambiguous definition for *recycled material content* as it applies to glass products (or "recycled glass content"); however, there is no national precedence for the definition of *recycled glass content* and actual implementation of this definition as an environmental attribute may prove to be extremely difficult. However, it is possible to develop an unambiguous definition for *recycled glass content* based on state regulations. Purchasing products using this definition of *recycled glass content* will result in an overall life cycle cost savings.

Our professional recommendation is that the environmental attribute *recycled glass content* should not be incorporated into the FLIS database without additional research to determine the feasibility of implementation. Such research was outside the scope of this project.

In conclusion, *recycled glass content* might meet the evaluation criteria established by JG-EnvAtt as an environmental attribute that could be included in the FLIS system. DLA must determine:

1. If it is appropriate to use State Regulations as the basis for the definition of an environmental attribute, and
2. If implementation of this definition as an environmental attribute in the FLIS system is feasible.

If DLA decides to include this environmental attribute in FLIS, Litton-PRC and PPC recommend that the JG-EnvAtt Coordinating Committee use California State regulations as the basis for defining *recycled glass content*.

## Appendix A -Products Currently Designated in EPA's Comprehensive Purchasing Guidelines

Product Category	Specifics Products Covered
Paper and Paper Products	All
Vehicular Products	Engine Coolants Re-refined Lubricating Oils Retread Tires
Construction Products	Building Insulation Products Carpet Cement and Concrete Containing Coal Fly Ash Cement and Concrete Containing Ground Granulated Blast Furnace Slag Consolidated and Reprocessed Latex Paints Floor Tiles Laminated Paperboard Patio Blocks Shower and Restroom Dividers/Partitions Structural Fiberboard
Transportation Products	Channelizers Delineators Flexible Delineators Parking Stops Traffic Barricades Traffic Cones
Park and Recreation Products	Plastic Fencing Playground Surfaces Running Tracks
Landscaping Products	Garden and Soaker Hoses Hydraulic Mulch Lawn and Garden Edging Yard Trimmings Compost
Non-paper Office Products	Binders Office Recycling Containers Office Waste Receptacles Plastic Desktop Accessories Plastic Envelopes Plastic Trash Bags Printer Ribbons Toner Cartridges
Miscellaneous Products	Pallets

## Appendix B - Acronyms

AISI	American Iron and Steel Institute
CFR	Code of Federal Regulations
CPG	Comprehensive Procurement Guidelines
DISC	Defense Industrial Supply Center
DLA	Defense Logistics Agency
DOE	Department of Energy
EPA	Environmental Protection Agency
FLIS	Federal Logistics Information System
GSA	General Services Administration
ISRI	Institute of Scrap Recycling Industries
JG-EnvAtt	Joint Group on Environmental Attributes
JLC	Joint Logistics Commanders
P2	Pollution Prevention
PPA	Pollution Prevention Act

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